

**Amendments to the Claims**

Please amend the claims as instructed in the marked-up version of the Listing of the Claims presented below. This Listing of the Claims replaces all prior versions, and listings, of claims in the application.

**Listing of the Claims**

1. (Currently Amended) A control circuit for controlling a motor, the control circuit comprising:
  - a contactor circuit including a contactor and having first and second ends; and
  - a snubber circuit connected across the contactor circuit, the snubber circuit including
    - a first port electrically connected to the first end of the contactor circuit,
    - a second port electrically connected to the second end of the contactor circuit,
    - a first sub-circuit electrically connected to one of the first and second ports, the first sub-circuit including a resistor and a non-linear device electrically connected in parallel branches, and
      - a second sub-circuit electrically connected in series with the first sub-circuit and to the other of the first and second ports, the second sub-circuit including an energy storage device and a second non-linear device, the energy storage device and the second non-linear device are electrically connected in parallel branches.
2. (Original) A control circuit as set forth in claim 1 wherein the non-linear device includes a diode.
3. (Original) A control circuit as set forth in claim 1 wherein the energy storage device includes a capacitor.
4. (Original) A control circuit as set forth in claim 1 wherein the snubber circuit receives a first current flowing from the first port through the first and second sub-circuits to the second port, and wherein a substantial portion of the first current flows through the non-linear device when the first current flows through the first sub-circuit.

5. (Original) A control circuit as set forth in claim 4 wherein the energy storage device charges when the first current flows through the second sub-circuit.

6. (Original) A control circuit as set forth in claim 5 wherein the energy storage device discharges when the contactor is closed, wherein the energy discharged from the energy storage device creates a second current that flows through the first sub-circuit opposite the first current, and wherein a substantial portion of the second current flows through the resistor when the second current flows through the first sub-circuit.

7. (Currently Amended) A control circuit ~~as set forth in claim 1 for controlling a motor, the~~ control circuit comprising:

a contactor circuit including a contactor and having first and second ends;

a snubber circuit connected across the contactor circuit, the snubber circuit including

a first port electrically connected to the first end of the contactor circuit,

a second port electrically connected to the second end of the contactor circuit,

a first sub-circuit electrically connected to one of the first and second ports, the  
first sub-circuit including a resistor and a non-linear device electrically connected in parallel  
branches,

a second sub-circuit electrically connected in series with the first sub-circuit and  
to the other of the first and second ports, the second sub-circuit including an energy storage  
device; and

wherein the non-linear device is a first diode, wherein the second sub-circuit further includes a second non-linear device, and wherein the energy storage device and the second non-linear device are electrically connected in parallel branches.

8. (Original) A control circuit as set forth in claim 7 wherein the first and second non-linear devices each includes a diode, and wherein the energy storage device includes a capacitor.

9. (Original) A control circuit as set forth in claim 7 wherein the snubber circuit receives a first current flowing from the first port through the first and second sub-circuits to the second port, and wherein a substantial portion of the first current flows through the first non-linear device when the first current flows through the first sub-circuit.
10. (Original) A control circuit as set forth in claim 9 wherein the energy storage device charges when the first current flows through the second sub-circuit.
11. (Original) A control circuit as set forth in claim 10 wherein the energy storage device discharges when the contactor is closed, wherein the energy discharged from the energy storage device creates a second current that flows through the first sub-circuit opposite the first current, and wherein a substantial portion of the second current flows through the resistor when the second current flows through the first sub-circuit.
12. (Original) A control circuit as set forth in claim 9 wherein the snubber circuit receives a second current flowing from the second port through the first and second sub-circuits to the first port, and wherein a substantial portion of the second current flows through the second non-linear device when the second current flows through the second sub-circuit.
13. (Original) A control circuit for controlling a motor, the control circuit comprising:
  - a contactor circuit including a contactor and having first and second ends; and
  - a snubber circuit connected across the contactor circuit, the snubber circuit including
    - a first port electrically connected to the first end of the contactor circuit;
    - a second port electrically connected to the second end of the contactor circuit;
    - a first sub-circuit electrically connected to one of the first and second ports, the first sub-circuit including a resistor and a first non-linear device electrically connected in parallel branches; and
    - a second sub-circuit electrically connected in series with the first sub-circuit and to the other of the first and second ports, the second sub-circuit including a energy storage device and a second non-linear device electrically connected in parallel branches.

14. (Original) A control circuit as set forth in claim 13 wherein the snubber circuit receives a first current flowing from the first port through the first and second sub-circuits to the second port, wherein a substantial portion of the first current flows through the non-linear device when the first current flows through the first sub-circuit, and wherein the energy storage device charges when the first current flows through the second sub-circuit.
15. (Original) A control circuit as set forth in claim 14 wherein the energy storage device discharges when the contactor is closed, wherein the energy discharged from the energy storage device creates a second current that flows through the first sub-circuit opposite the first current, and wherein a substantial portion of the second current flows through the resistor when the second current flows through the first sub-circuit.
16. (Original) A control circuit as set forth in claim 15 wherein the first and second non-linear devices each includes a diode, and where the energy storage device includes a capacitor.

17. (Original) A control circuit for controlling a motor, the control circuit comprising:

- a contactor circuit including a contactor and having first and second ends; and
- a snubber circuit connected across the contactor circuit, the snubber circuit including
  - a first port electrically connected to the first end of the contactor circuit and operable to receive a first current flow having a first direction,
  - a second port electrically connected to the second end of the contactor circuit and operable to receive a second current flow having a second direction opposite the first direction,
  - a first sub-circuit electrically connected to one of the first and second ports and including a resistor and a first diode electrically connected in circuit in parallel branches, the first diode being operable to allow a substantial portion of the first current to flow through the first diode when the first current flows through the first sub-circuit, and the resistor being operable to allow a substantial portion of the second current to flow through the resistor when the second current flows through the first sub-circuit, and
  - a second sub-circuit electrically connected in series with the first sub-circuit and to the other of the first and second ports, the second sub-circuit including a capacitor and a second diode electrically connected in circuit in parallel branches, the second diode being operable to allow a substantial portion of the second current to flow through the second diode when the second current flows through the first sub-circuit, and the capacitor charges when the first current flows through the second sub-circuit.

18. (Currently Amended) A vehicle comprising:

a motor; and

a control circuit operable to control the motor, the control circuit including a contactor circuit having a contactor, a first end and a second end, and a snubber circuit connected across the contactor circuit, the snubber circuit including

a first port electrically connected to the first end of the contactor circuit,

a second port electrically connected to the second end of the contactor circuit,

a first sub-circuit electrically connected to one of the first and second ports, the first sub-circuit including a resistor and a non-linear device electrically connected in parallel branches, and

a second sub-circuit electrically connected in series with the first sub-circuit and to the other of the first and second ports, the second sub-circuit including an energy storage device and a second non-linear device electrically connected in parallel branches.

19. (Original) A vehicle as set forth in claim 18 wherein the non-linear device includes a diode.

20. (Original) A vehicle as set forth in claim 18 wherein the energy storage device includes a capacitor.

21. (Original) A vehicle as set forth in claim 18 wherein the snubber circuit receives a first current flowing from the first port through the first and second sub-circuits to the second port, and wherein a substantial portion of the first current flows through the non-linear device when the first current flows through the first sub-circuit.

22. (Original) A vehicle as set forth in claim 21 wherein the energy storage device charges when the first current flows through the second sub-circuit.

23. (Original) A vehicle as set forth in claim 22 wherein the energy storage device discharges when the contactor is closed, wherein the energy discharged from the energy storage device creates a second current that flows through the first sub-circuit opposite the first current, and wherein a substantial portion of the second current flows through the resistor when the second current flows through the first sub-circuit.

24. (Currently Amended) A vehicle as set forth in claim 18 comprising:

a motor; and

a control circuit operable to control the motor, the control circuit including a contactor circuit having a contactor, a first end and a second end, and a snubber circuit connected across the contactor circuit, the snubber circuit including

a first port electrically connected to the first end of the contactor circuit,

a second port electrically connected to the second end of the contactor circuit,

a first sub-circuit electrically connected to one of the first and second ports, the first sub-circuit including a resistor and a non-linear device electrically connected in parallel branches, and

a second sub-circuit electrically connected in series with the first sub-circuit and to the other of the first and second ports, the second sub-circuit including an energy storage device; and

wherein the non-linear device is a first diode, wherein the second sub-circuit further includes a second non-linear device, and wherein the energy storage device and the second non-linear device are electrically connected in parallel branches.

25. (Original) A vehicle as set forth in claim 24 wherein the first and second non-linear devices each includes a diode, and wherein the energy storage device includes a capacitor.

26. (Original) A vehicle as set forth in claim 24 wherein the snubber circuit receives a first current flowing from the first port through the first and second sub-circuits to the second port, and wherein a substantial portion of the first current flows through the first non-linear device when the first current flows through the first sub-circuit.

27. (Original) A vehicle as set forth in claim 26 wherein the energy storage device charges when the first current flows through the second sub-circuit.

28. (Original) A vehicle as set forth in claim 27 wherein the energy storage device discharges when the contactor is closed, wherein the energy discharged from the energy storage device creates a second current that flows through the first sub-circuit opposite the first current, and wherein a substantial portion of the second current flows through the resistor when the second current flows through the first sub-circuit.

29. (Original) A vehicle comprising:

a motor; and

a control circuit operable to control the motor, the control circuit including a contactor circuit having a contactor, a first end and a second end, and a snubber circuit connected across the contactor circuit, the snubber circuit including

a first port electrically connected to the first end of the contactor circuit;

a second port electrically connected to the second end of the contactor circuit;

a first sub-circuit electrically connected to one of the first and second ports, the first sub-circuit including a resistor and a first non-linear device electrically connected in parallel branches; and

a second sub-circuit electrically connected in series with the first sub-circuit and to the other of the first and second ports, the second sub-circuit including a energy storage device and a second non-linear device electrically connected in parallel branches.

30. (Original) A vehicle as set forth in claim 29 wherein the snubber circuit receives a first current flowing from the first port through the first and second sub-circuits to the second port, wherein a substantial portion of the first current flows through the non-linear device when the first current flows through the first sub-circuit, and wherein the energy storage device charges when the first current flows through the second sub-circuit.

31. (Original) A vehicle as set forth in claim 29 wherein the energy storage device discharges when the contactor is closed, wherein the energy discharged from the energy storage device creates a second current that flows through the first sub-circuit opposite the first current, and wherein a substantial portion of the second current flows through the resistor when the second current flows through the first sub-circuit.

32. (Original) A vehicle as set forth in claim 30 wherein the first and second non-linear devices each includes a diode, and where the energy storage device includes a capacitor.

33. (Currently Amended) A method of suppressing arcing in a contactor circuit including a contactor having at least two contacts that make and break an electrical connection, the method comprising the acts of:

providing a snubber circuit including a first sub-circuit and a second sub-circuit electrically connected in series, the first sub-circuit including a first branch having a resistor and a second branch having a first non-linear device, and the second sub-circuit including having a third branch having a second non-linear device and a fourth branch having a storage device;

electrically connecting the first sub-circuit to one end of the contactor circuit;

electrically connecting the second sub-circuit to the other end of the contactor circuit;

breaking the electrical connection of the contacts;

generating a first current in response to the breaking of the electrical connection;

allowing a substantial portion of the first current to flow through the non-linear device;

and

charging the energy storage device with energy of the first current.

34. (Original) A method as set forth in claim 33 and further comprising the acts of:

after the charging act, making the electrical connection of the contacts;

generating a second current in response to the making of the electrical connection, the second current flowing in an opposite direction of the first current; and

allowing a substantial portion of the second current to flow through the resistor.

35. (Original) A method as set forth in claim 33 wherein the non-linear device includes a diode.

36. (Original) A method as set forth in claim 33 wherein the storage device includes a capacitor.

37. (Currently Amended) A method ~~as set forth in claim 33 of suppressing arcing in a contactor circuit including a contactor having at least two contacts that make and break an electrical connection, the method comprising the acts of:~~

providing a snubber circuit including a first sub-circuit and a second sub-circuit electrically connected in series, the first sub-circuit including a first branch having a resistor and a second branch having a non-linear device, and the second sub-circuit including a storage device;

electrically connecting the first sub-circuit to one end of the contactor circuit; electrically connecting the second sub-circuit to the other end of the contactor circuit;

breaking the electrical connection of the contacts;

generating a first current in response to the breaking of the electrical connection;

allowing a substantial portion of the first current to flow through the non-linear device;

and

charging the energy storage device with energy of the first current; and

wherein the non-linear device is a first non-linear device, and wherein the second sub-circuit further includes a third branch having a second non-linear device and a fourth branch having the storage device capacitor.

38. (Original) A method as set forth in claim 37 and further comprising the acts of:

breaking the electrical connection of the contacts a second time;

generating a second current in an opposite direction of the first current in response to the breaking of the electrical connection the second time;

allowing a substantial portion of the second current to flow through the second non-linear device; and

allowing a substantial portion of the second current to flow through the resistor.

39. (Original) A method as set forth in claim 38 wherein the storage device includes a capacitor.

40. (Original) A method as set forth in claim 38 wherein the first and second non-linear devices include a first and second diode, respectively.